

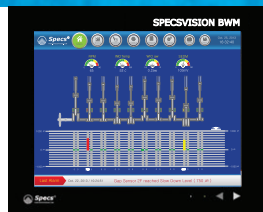
Marine Safety, Instrumentation and Control System



COMD



AOMD



BWM



SPM



TPM



BWMS

Products for Marine Industry

- Oil Mist Detection System for engine room (AOMD)
- Oil Msit Detection System for diesel engine (COMD)
- Bearing Wear Monitoring System (BWM)
- Ship Performance Monitoring system (SPM)
- Shaft Torque Power RPM Meter (TPM)
- Float Level Gauging System (FLG)
- Level Temperature Density Gauging System (LTD)
- Power Transmission System
- UV Sterilizer, Actuator, On-off Valve
- Gaskets, Sealing Materials
- Ballast Water Management System (BWMS)

Introduction

Since the foundation of the company in 1970, SPECS Corporation has put its highest priority of concern on meeting the diverse and difficult needs of its clients and becoming an innovative leader in the technologies that the company is pursuing.

SPECS is now one of the undisputed leaders in its area of expertises, which to provides products and services for safety, instrumentation and control systems required by marine and related industries.

During the last decades of its history, marine industry has acknowledged Oil Mist Detector (OMD) system as an important measurement to reduce the risk of fire from machinery space flammable oil systems or explosions induced by oil mist inside diesel engine crank case.

Though SPECS is one of the latest participants in this market, its oil mist detector for engine room (AOMD) and the one for inside crankcase (COMD) have already obtained reputation of being the top quality products throughout global clients.

For those SPECS AOMD and COMD, type approvals by major classification societies of the world have been granted.

Bearing wear monitoring system(BWM) is another result of SPECS' continuous efforts to respond to the needs of its clients. SPECS' BWM system can check the wear conditions of bearing in ship engine by real time monitoring.

Included above OMD, BWM system, SPECS supplies ship's monitoring system which consist of SPM(Ship Performance Monitoring system), TPM I (Shaft Torque Power RPM Meter) and TPM II (Shaft Torque Power RPM Meter). This System can monitor, check and help to maintain better performance for ship's energy saving.

SPECS provides the systems and services including installation, consulting and repair.

Other than above products for marine industry, SPECS also manufactures and supplies products such as LTD System in LNG Terminals and FSRU, FLG in LNG carriers, gaskets of different designs, UV sterilizing systems, actuators, on-off valves and mechanical power transmissions to various industries.



Major Products



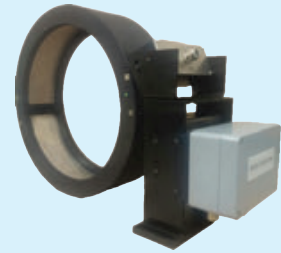
AOMD



COMD



OMM



TPM



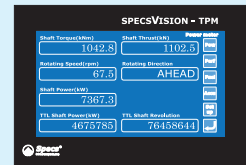
BWM



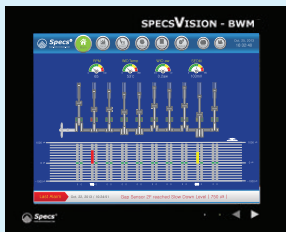
SPM



OMM



TPM



BWM



SPM



LTD

Major Customers



Global Service Network



SPECS provides local service and support at major locations world wide. Service and support work is carried out under the supervision of your personal quality manager, who will ensure that you receive high-quality service and solution where and when you need it.

All of your contacts with this quality manager will, we feel, give you confidence in our expertise and capability, of providing you with a fast and efficient service. This service will be specifically designed to improve and optimize your system performance and availability.

To meet your expected requirement and with a local inventory of spare parts, our well-qualified field service engineers will help you timely and effectively.



H.Q.

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SPECS Torque Power Meter technology is being adopted as ISO standard

ISO Working Group meeting, ISO TC8/SC2/WG8, Shaft power measurement for ships, was held at Baltimore, USA to discuss ways to standardize the measurement of shaft power from last June 21 to 23. This meeting was hosted by Dr. Carolyn E. Junemann from USDOT maritime and ISO chairperson Dr Koichi Yoshida, Mr. ilsub Shin of KOMERI, Mr. Hideki Saito of JSTRA and others were attended.

Mr Justino Seo who is the senior researcher of SPECS was invited as an expert of shaft power meter.

He explained the need for standardization of the measuring shaft power and excellence of the strain gauge type torque measurement method which is including technology for improving data reliability.

In addition, he insisted the necessity of the equipment for the verification of Shaft power instruments in order to improve the reliability of these instruments.

The thing that makes this invitation of Mr. Seo as an expert in ISO conference is the proof of the recognition for SPECS technical expertise and also is the proof of the SPECS capabilities which have accumulated in shaft power measurement areas of the ship.



[Meeting was held at Cape Washington]



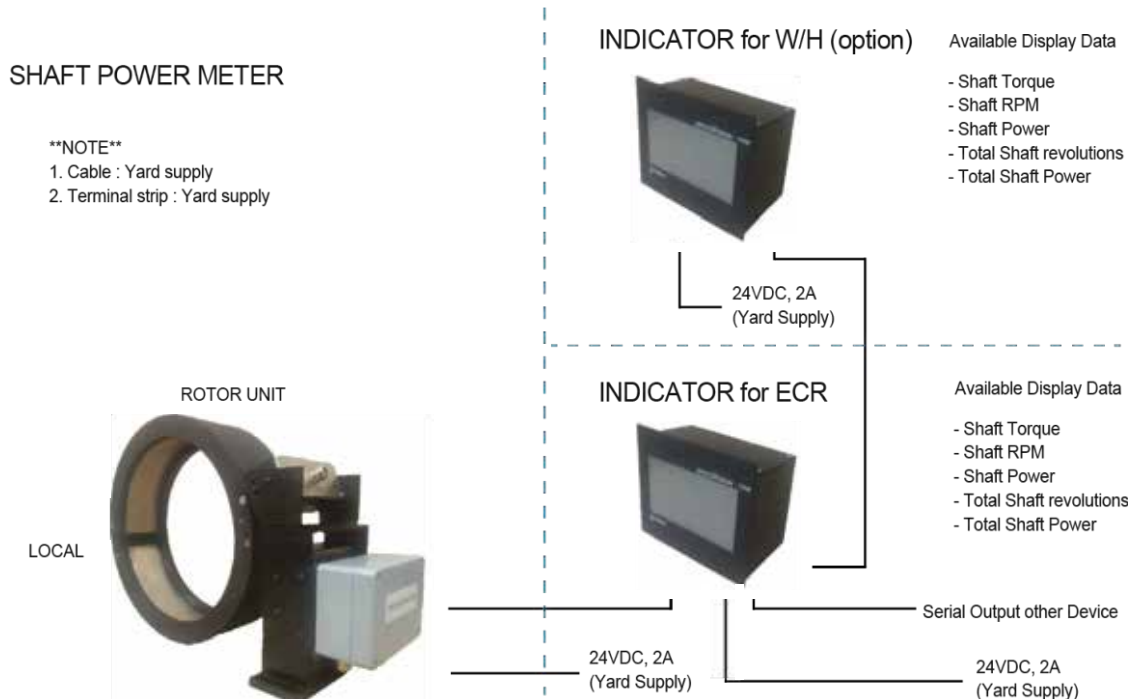
[SPECS Torque Power Meter is installed at vessel]

Based on these facts, SPECS products have been provided for over 110 vessels, Cardiff Marine, Dutch Shell, Hanjin Shipping, Hyundai Merchant Marine, SK Shipping, Pan Ocean, Hyundai GLOVIS and so on.

SPECSVISION products have already been proven in quality as well performance and obtained reputation of being the top quality products throughout global customers.

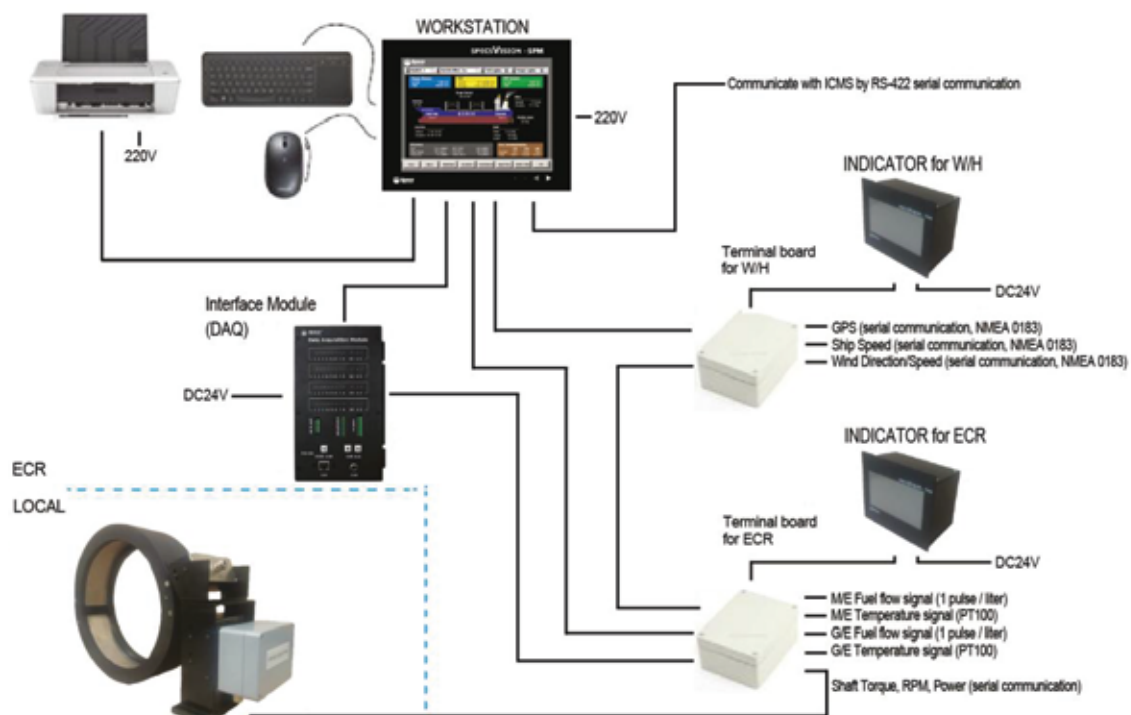
SPECS Shaft Torque Power RPM Meter

Simple, but It can measure and display shaft torque, thrust, power, RPM. Rotating direction, accumulated rotations which are transferred from the main engine to the propeller by adopting strain gage and proximity sensor technique. It is easy to install on all kinds of vessels both new and existed. Both metric and SI are available.



SPECS Ship Performance Monitoring system

Most useful and practical tool monitoring, reporting and verification of CO₂ emissions and energy efficiency of all ships, it has following functions which can be adjusted based on the different ship types, sizes and operational profiles

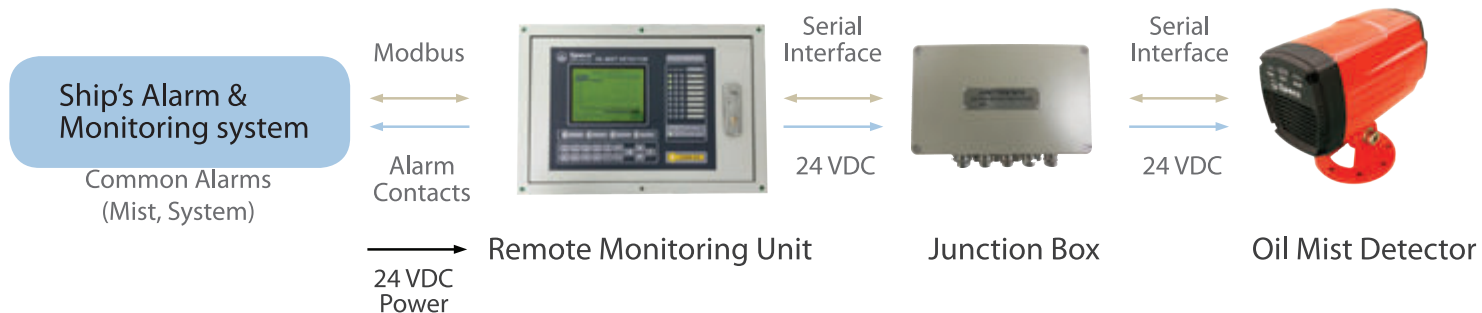


SPECVISION-III A

Engine Room Oil Mist Detection System

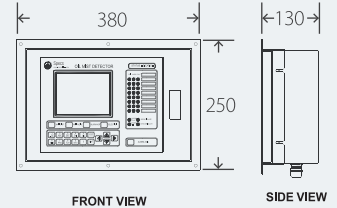
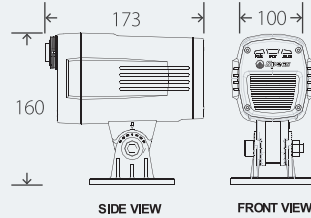


Atmospheric OMD System

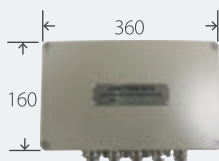


SYSTEM FEATURES

- Newest version based on recent IACS effectiveness verified based on M67 rules
- Superior accuracy verified
- Most rigid assembly
- Instantaneous response to alarm
- RS-485 / 422 to Ship's alarm monitoring system
- Less contaminated sensor design
- Highly integrated single board design
- Robust anti-vibration assembly
- Multi- functional remote monitoring unit
- Proven test and calibration chamber
- MIL STD-167, MIL-S-901D

SPECVISION-ⅢA*Engine Room
Oil Mist Detection System***TECHNICAL SPECIFICATIONS****Oil Mist Detector**

Type	VISION ⅢA Multi Sensor
Sensitivity	0.01 mg/ℓ
Communication Between RMU & Detector	RS-485 or 4~20 mA at range of 0~5.0 mg/ℓ
Indication	Green : Power ON Yellow : System Fault Red : Mist Alarm
5- Way Plug in Connector or Cable gland	Power : 1, 2 pin Signal : 3, 4 pin Shield : 5 pin
Mounting	Standard Stand or Bracket
Enclosure Rating	IP 44
Power	24 VDC
Temp. Rating(Operation)	0°C to 70°C
Dimensions	H 160 x W 100 x D 173 mm
Weight	1.4 kg
Housing	PPA +GF 30%, Halogen free, Aluminum Body

**Junction Box**

Type	VISION ⅢA
Max. No. of Detector Input	14, Individual Connection
Enclosure Rating	IP 56
Temp. Rating	0°C to 70°C
Dimensions	H 160 x W 360 x D 90 mm
Weight	3.5 kg
Housing	Aluminum

Remote Monitoring Unit (RMU)

Type	VISION ⅢR
Display	6" Monochrome LCD(340 x 240) Mist-Level Display Mode (Bar & Digital Value)
Scanning Time	50 msec for each point
Max. No. of Group	8 Groups (14pts per group)
Max. No. of Detector	112 points
Measuring Range	0~5.00 mg/ℓ
Communication Signal Output	RS-485(protocol : MODBUS Dual)
Memory	
Event log	3000 Data
History log	Every 10 sec, up to 12 hrs
Alarm & Failure Status	
Mist high alarm	RMU- Red LED ON(Alarm Indicator Panel)
Pre-warning alarm	Alarm Channel Displayed on LCD
System fault alarm	RMU-Yellow LED ON (Fan / Communication Alarm Indicator Panel)
Alarm Setting	Mist High Alarm(Max. 2.5 mg/ℓ) Pre-warning alarm : User adjustable
Alarm Contacts	Mist High : N.O(8 ea) Pre-warning alarm : N.C(8 ea) N.O/N.C selectable 125 VAC 0.5 A, 30 VDC 1.0 A, 1a1b
Enclosure Rating	IP 44
Power	24 VDC
Current rating	1.5 A
Over voltage protection	+30% -20% of voltage rating(24 VDC)
Temp. Rating	0°C to 70°C
Dimensions	
Wall Mounting	H 250 x W 380 x D 130 mm
Flush Mounting	H 290 x W 420 x D 130 mm
Weight	7.5 kg
Housing	Carbon Steel

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SPECVISION-III C

Diesel Engine Crank Case Oil Mist Detection System

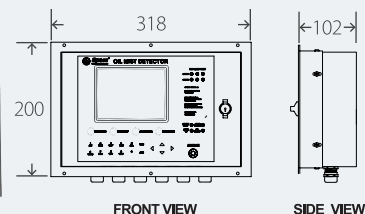
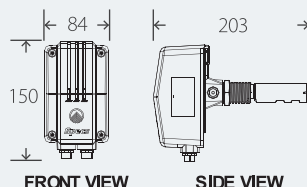


Diesel Engine Crank Case OMD System

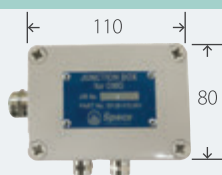


SYSTEM FEATURES

- Newest version based on recent IACS effectiveness verified based on M67 rules
- Superior accuracy verified
- Most rigid assembly
- Instantaneous response to alarm
- RS-485 / 422 to Ship's alarm monitoring system
- Less contaminated sensor design
- Highly integrated single board design
- Robust anti-vibration assembly
- Multi- functional remote monitoring unit
- Proven test and calibration chamber

SPECVISION-ⅢC*Diesel Engine Crank Case Oil Mist Detection System***TECHNICAL SPECIFICATIONS****Oil Mist Detector**

Type	VISION ⅢC
Sensitivity	0.01 mg/ℓ
Communication Between RMU & Detector	RS-485
Indication	Green : Power ON Yellow : System Fault Red : Mist Alarm
5- Way Plug in Connector	Power : 1, 2 pin Signal : 3, 4 pin Shield : 5 pin
Mounting	3/4" PF
Enclosure Rating	IP 56
Power	24 VDC
Temp. Rating(Operation)	0°C to 70°C
Dimensions	H 150 x W 84 x D 203 mm
Weight	0.6 kg
Housing	PPA +GF 30%, Halogen free

**Junction Box**

Type	VISION ⅢC
Max. No. of Detector Input	14 Loop Connection
Enclosure Rating	IP 56
Temp. Rating	0°C to 70°C
Dimensions	H 80 x W 110 x D 70 mm
Weight	0.35 kg
Housing	PC + ABS

Remote Monitoring Unit (RMU)

Type	VISION ⅢR
Display	6" Monochrome LCD(340 x 240) Mist-Level Display Mode (Bar & Digital Value)
Scanning Time	50 msec for each point
Max. No. of Group	8 Groups (14pts per group)
Max. No. of Detector	112 points
Measuring Range	0~5.00 mg/ℓ
Communication Signal Output	RS-485(protocol : MODBUS Dual)
Memory Event log History log	3000 Data Every 10 sec up to 12hrs
Alarm & Failure Status Mist Alarm	
Mist high alarm	RMU- Red LED ON(Alarm Indicator Panel)
Pre-warning alarm	Alarm Channel Displayed on LCD
System fault alarm	RMU-Yellow LED ON (Fan / Communication Alarm Indicator Panel) and Failed Channel Displayed on LCD
Alarm Setting	Mist High Alarm(Max. 2.5 mg/ℓ) Pre-warning alarm : User adjustable
Alarm Contacts	Mist High : N.O(8 ea) Pre-warning alarm : N.C(8 ea) N.O/N.C selectable 125 VAC 0.5 A, 30 VDC 1.0 A, 1a1b
Enclosure Rating	IP 44
Power	24 VDC
Current rating	1.5 A
Over voltage protection	+30% -20% of voltage rating (24 VDC)
Temp. Rating	0°C to 70°C
Dimensions	
Wall Mounting	H 200 x W 318 x D 102 mm
Flush Mounting	H 237 x W 353 x D 102 mm
Weight	6.0 kg
Housing	Carbon Steel

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Busan Office

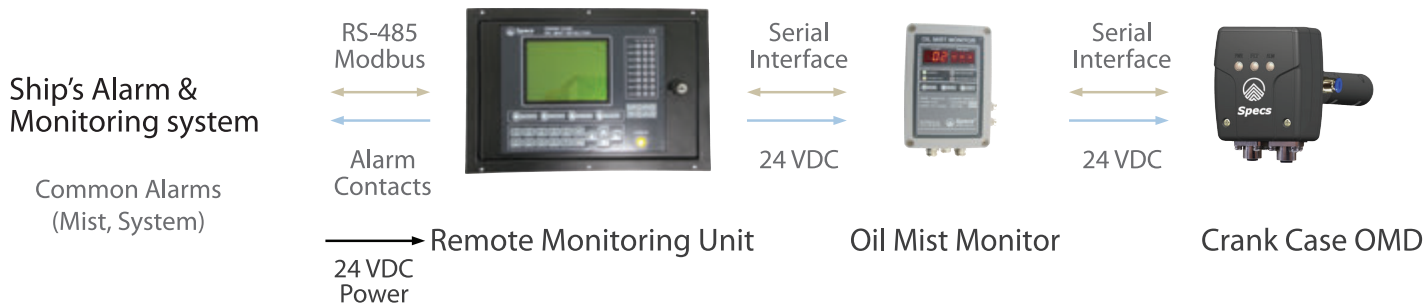
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SPECVISION-5C

Diesel Engine Crank Case Oil Mist Detection System

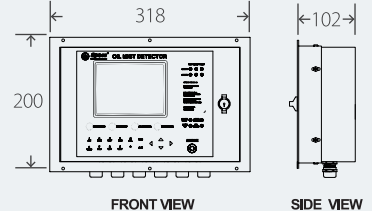
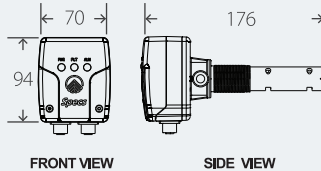


Diesel Engine Crank Case OMD System



SYSTEM FEATURES

- Newest version based on recent IACS effectiveness verified based on M67 rules
- Superior accuracy verified
- Instantaneous response to alarm
- RS-485 / 422 to Ship's alarm monitoring system
- Multi- functional remote monitoring unit
- Most compact/rigid design
- Light scattering measurement
- Less contaminated sensor design
- No moving parts
- Robust anti-vibration assembly
- Upward/downward cable connection

SPECVISION-5C*Diesel Engine Crank Case
Oil Mist Detection System***TECHNICAL SPECIFICATIONS****Oil Mist Detector**

Type	VISION 5C
Sensitivity	0.01 mg/ℓ
Communication Between RMU & Detector	RS-485
Indication	Green : Power ON Yellow : System Fault Red : Mist Alarm
5- Way Plug in Connector	Power : 1, 2 pin Signal : 3, 4 pin Shield : 5 pin
Mounting	3/4" PF
Enclosure Rating	IP 56
Power	24 VDC
Temp. Rating(Operation)	0°C to 70°C
Dimensions	H 94 x W 70 x D 176 mm
Weight	0.3 kg
Housing	PPA +GF 30%, Halogen free

**Oil Mist Monitor**

Type	VISION IIIJC
Max. No. of Detector Input	14 Loop Connection
Enclosure Rating	IP 56
Temp. Rating	0°C to 70°C
Dimensions	H 80 x W 110 x D 70 mm
Weight	0.35 kg
Housing	PC + ABS

Remote Monitoring Unit (RMU)

Type	VISION IIIR
Display	6" Monochrome LCD(340 x 240) Mist-Level Display Mode (Bar & Digital Value)
Scanning Time	50 msec for each point
Max. No. of Group	8 Groups (14pts per group)
Max. No. of Detector	112 points
Measuring Range	0~5.00 mg/ℓ
Communication Signal Output	RS-485(protocol : MODBUS Dual)
Memory	
Event log	3000 Data
History log	Every 10 sec up to 12hrs
Alarm & Failure Status	
Mist high alarm	RMU- Red LED ON(Alarm Indicator Panel)
Pre-warning alarm	Alarm Channel Displayed on LCD
System fault alarm	RMU-Yellow LED ON (Fan / Communication Alarm Indicator Panel) and Failed Channel Displayed on LCD
Alarm Setting	Mist High Alarm(Max. 2.5 mg/ℓ) Pre-warning alarm : User adjustable
Alarm Contacts	Mist High : N.O(8 ea) Pre-warning alarm : N.C(8 ea) N.O/N.C selectable 125 VAC 0.5 A, 30 VDC 1.0 A, 1a1b
Enclosure Rating	IP 44
Power	24 VDC
Current rating	1.5 A
Over voltage protection	+30 % -20 % of voltage rating(24 VDC)
Temp. Rating	0°C to 70°C
Dimensions	
Wall Mounting	H 200 x W 318 x D 102 mm
Flush Mounting	H 237 x W 353 x D 102 mm
Weight	6.0 kg
Housing	Carbon Steel

**Head Office**

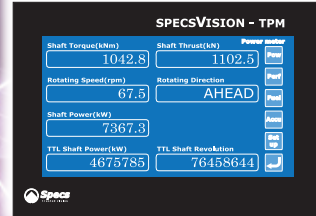
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SPECVISION-TPM

Shaft Torque Power RPM Meter



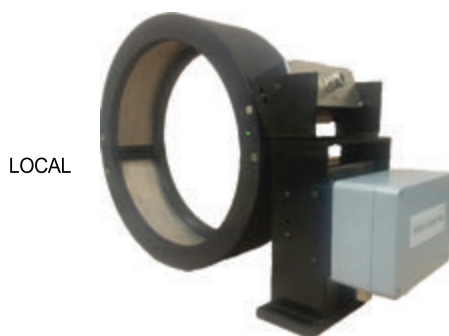
SPECS Shaft Torque Power RPM Meter is simple, but it can measure and display shaft torque, thrust, power, RPM, rotating direction, accumulated rotations which are transferred from the main engine to the propeller by adopting strain gage and proximity sensor technique. It is easy to install on all kinds of vessels both new and existed. Both metric and SI are available.

SHAFT POWER METER

NOTE

1. Cable : Yard supply
2. Terminal strip : Yard supply

ROTOR UNIT



INDICATOR for W/H (option)



Available Display Data

- Shaft Torque
- Shaft RPM
- Shaft Power
- Total Shaft revolutions
- Total Shaft Power

24VDC, 2A
(Yard Supply)

INDICATOR for ECR



Available Display Data

- Shaft Torque
- Shaft RPM
- Shaft Power
- Total Shaft revolutions
- Total Shaft Power

24VDC, 2A
(Yard Supply)

Serial Output other Device

24VDC, 2A
(Yard Supply)

SYSTEM FEATURES

- Easy to install by using simple bracket arrangement
 - No shaft modifications
- Robust design for operation in particular environments
- Various outputs available for all data logging requirements
- Maximum shaft speed of 1500rpm for all shaft sizes
- High accuracy and repeatability
- Optional thrust measurement
- Not affected by any pollutional or hazardous materials
- Digital data transmission for clean reliable data
- Simple calibration setup for increased accuracy of torque data
- Large on-shaft tolerance makes it easy installation
- Single or dual shaft applications
- Maintenance free operation owing to no mechanical wear

SPECVISION-TPM

Shaft Torque Power RPM Meter

TECHNICAL SPECIFICATIONS

SHAFT SPECIFICATION

Measurable Shaft
Diameter Range

200 ~ 1000 mm



EQUIPMENT SPECIFICATIONS

Sensing Element

Torque

Strain gauge

Thrust

Strain gauge

Shaft Revolution

Proximity sensor



Control Display Unit

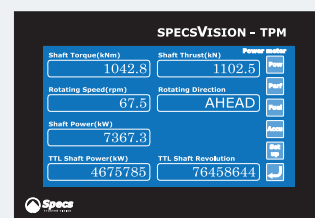
Display

Master(ECR)/Slave(W/H) mode installed on engine control room

Shaft torque, RPM, shaft power
Rotating direction, thrust(optional)
Accumulated shaft power and revolutions

Communication
Dimensions

Analog output (4-20mA), serial output (RS-485/422)
W210 X H150 X D140 mm



Remote Indicator

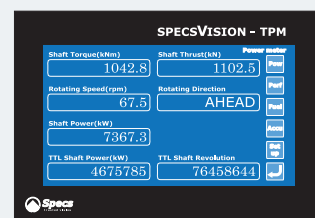
Display

Installed on W/H as a optional indicator

Shaft torque, RPM, shaft power
Rotating direction, thrust(optional)
Accumulated shaft power and revolutions

Communication
Dimensions

Analog output (4-20mA), serial output (RS-485/422)
W210 X H150 X D140 mm



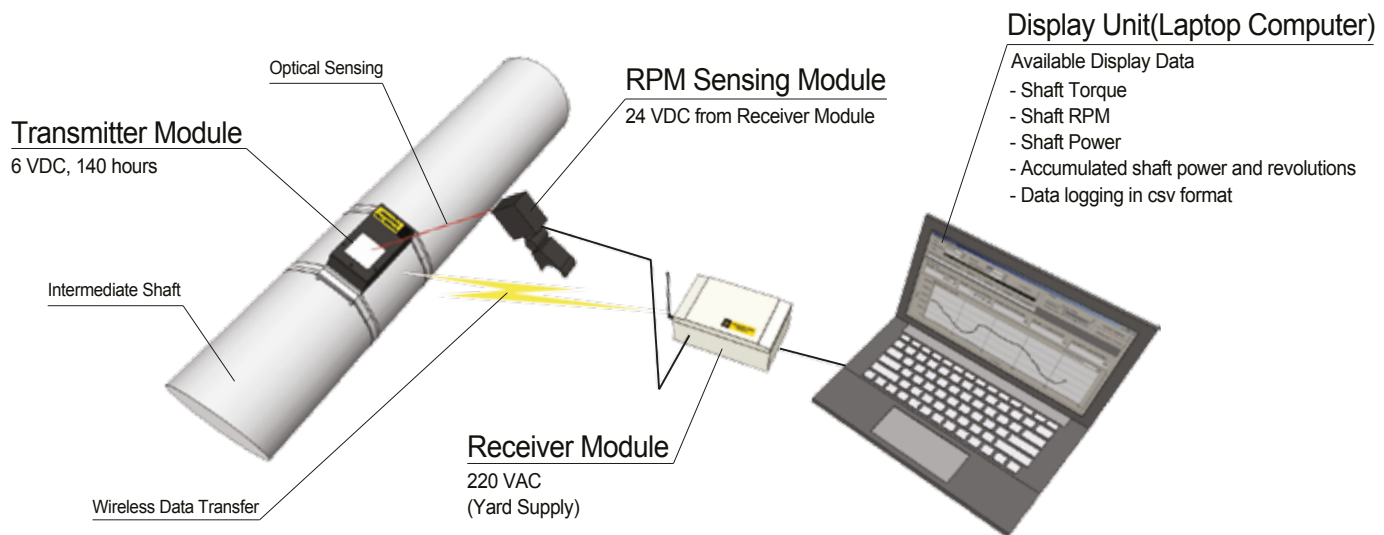
SPECSVISION Portable TPM

Portable Shaft Torque Power RPM Meter



SPECS Portable TPM is measurement instrument which can measure the shaft power by temporary installation at intermediate shaft of vessel. Users can measure the shaft power during the sea trial of vessel without a stationary shaft power meter. In that case, this portable TPM could help to check and verify the operating condition instead of the stationary power meter. Also Portable TPM is available to land applications which is required a torque measurement like Automotive drive shaft, Pumps & Compressors, Paper Mill, Wind power Turbine, Conveyors and etc.

CONFIGURATION



SYSTEM FEATURES

1. Available in small space (transmitter : W133 X H75 X D45 mm)
2. Easy to install
3. Optical sensor is used for measuring RPM.
4. Provide the dedicated software tool for indication, storage and analysis
5. Supplied with Strain gauge Installation Kit

SPECSVISION Portable TPM

Portable Shaft Torque Power RPM Meter

TECHNICAL SPECIFICATIONS

SHAFT SPECIFICATION

Measurable Shaft Diameter Range	200 ~ 1,000 mm
Measurable Shaft RPM range	up to 500 RPM
Shaft material	Steel alloys

EQUIPMENT SPECIFICATIONS

Sensing Element	
Torque	Strain gauge (resistance: 350 ohm, factor: 2.11)
Thrust	N/A
Shaft Revolution	Optical sensor

Accuracy

For normal signals (>200 iS)	Torque: $\pm 0.5\%$, Power: $\pm 0.5\%$, RPM: $\pm 0.5\%$
Ambient temp.	5 ~ 50 deg C.

Display Unit (LAPTOP Computer)

Display Data	Min. Spec.: CPU-Pentium 4, RAM-125MB, HDD-10MB of free space, OS-Windows XP, Power Input-100 ~ 240 VAC(50 ~ 60 Hz) Shaft RPM, Torque, Power Accumulated shaft power and revolutions Data logging by csv format
Communication	RS485 Serial communication with Receiver
Dimension/Weight	W300 X H200 X D20 mm / 2.0 kg



Receiver Module

Input Power	220 VAC(60Hz)
Dimension/Weight	W160 X H100 X D60 mm / 3.0 kg



Transmitter Module

Signal output	RF 2.4 GHz
Input Power	6 VDC (4 AAA alkaline batteries, min. 5 days active)
Dimension/Weight	W133 X H75 X D45 mm / 1.0 kg



RPM Sensing Module

Measuring Range	up to 500 RPM
Measuring Distance	up to 3 meters
Input Power	24 VDC from Receiver
Dimension/Weight	W150 X H40 X D60 mm / 0.2 kg



Total weight

12 kg (all components, accessories, tools and suitcase)



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SPECVISION-SPM

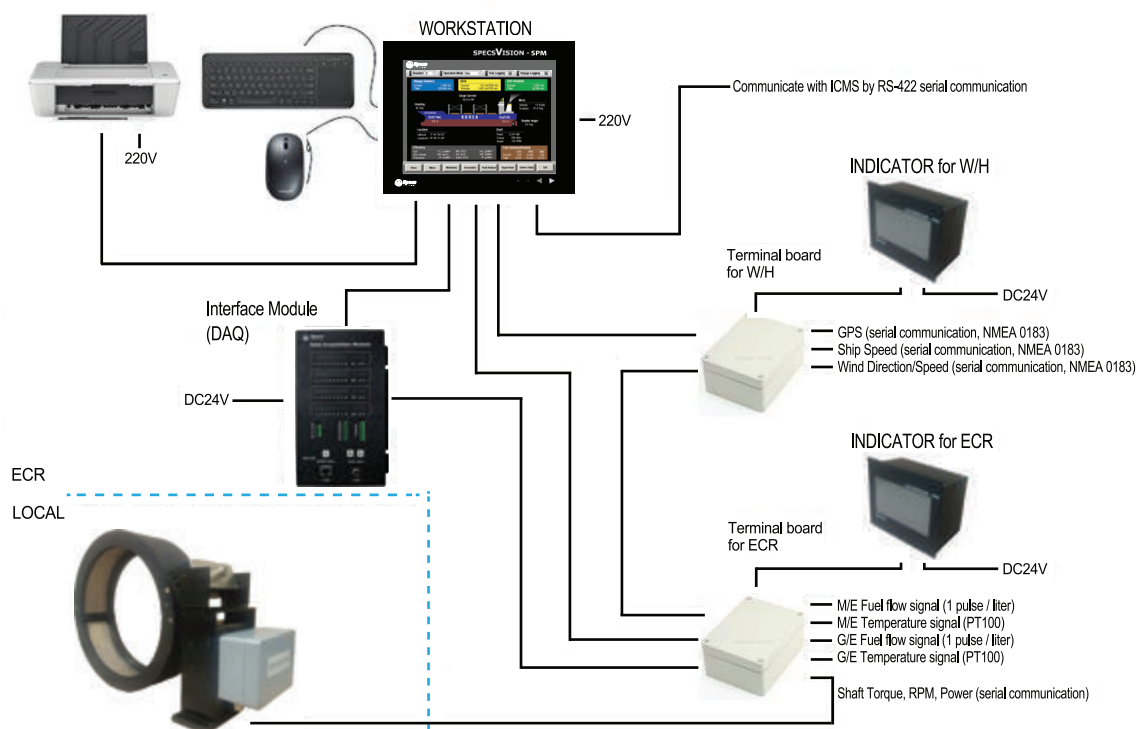
Ship Performance Monitoring system



SPECVISION-SPM is most useful and practical tool for monitoring, reporting and verification of CO₂ emissions and energy efficiency of all ships. It has following functions which can be adjusted based on the different ship types, sizes and operational profiles.

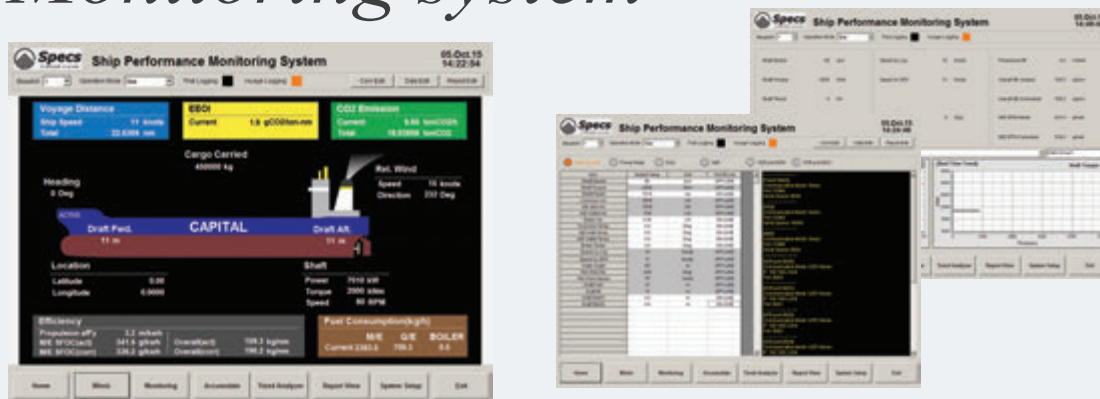
- Calculates and displays EEOI & CO₂ emission values as a valuable SEEMP mechanism based on IMO regulations.
- Displays, prints and stores real-time measurements and performance data
- Presents trend graphs of the data for a variable period of time
- Displays actual operational values compared with reference values of ideal case
- Easy maintenance by applying slot type card to DAQ
- Enables users to store more than 150 different data
- Enables engineers to make the optimum plan for ship maintenance and/or renovation based on the stored performance data
- Presents daily, voyage and sea trial reports
- Transfers various data to the owner via ship's network for fleet management.

Configuration



SPECVISION-SPM

Ship Performance Monitoring system



TECHNICAL SPECIFICATIONS

Input data	Interface for all possible data
Calculated values	Accumulated fuel consumption & main engine energy output, total revolutions, total distance travelled, main engine fuel efficiency, propulsion efficiency, vessel overall efficiency, EEOI and CO ₂ emission
Reference curves	Shaft power vs. rpm, shaft power vs. ship speed, fuel consumption vs. ship speed, specific fuel rate vs. shaft power
Trend curves	Short & long term trend of all instant data and calculated values for max. 30 years
Displays	Numeric and graphic display in colors
Reports	Daily, voyage and trial reports
Main controller/Monitor	15-inch color TFT-LCD display, capacitive touch screen, 1024 X 768 XGA Windows 7, 500GB HDD, 6USB, 2RS232, RS485/422, 2Ethernet W385 X H307 X D100 mm Flush panel mounting
Data aquisition modules	TTL input module: 8ch (DC 12~24V) Temp. input module: 4ch T/C or Pt 100 Analog input module : 10ch (4~20mA, 0~ 5V, -10V ~ +10V) Binary input module : 10ch (pulse, counter) Serial communication : 2ch (RS-485/RS-422, RS-232) Module extension : max. 10 modules



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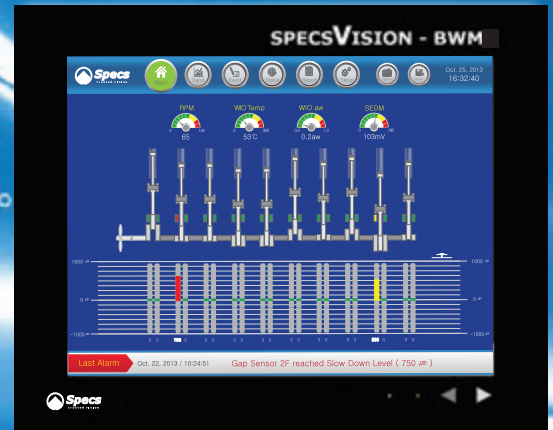
Byucksan Digital Valley, B-703, #303 Daedingro,
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SPECVISION-BWM

2-Stroke Engine

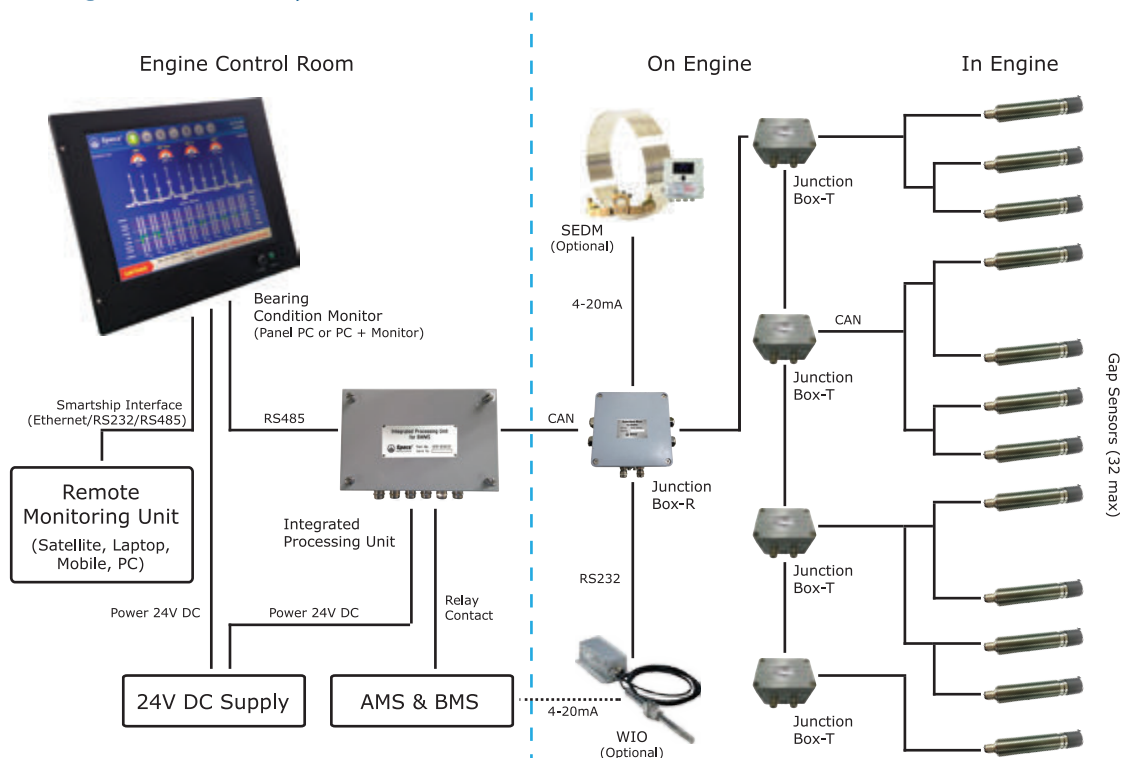
Bearing Wear

Monitoring System



SPECVISION-BWM is a useful tool for predicting bearing wear in 2-stroke engine before it becomes critical condition and the system provides early alarm or slowdown signal if unexpected problem occurs at the crank-train bearings comprised of crosshead, crank and main bearings during engine operation.

2-Stroke Engine BWM System



System Features

- Comply with latest MDT algorithm and IACS requirements
- Reliable and secure operation
- Most rigid structure
- Instantaneous response to alarm
- Interface with Ship's AMS & BMS
- Simple installation
- Most compact/rigid sensor
- Temperature compensated sensor design
- Highly integrated system design
- Robust anti-vibration assembly
- User-friendly HMI

SPECVISION- BWM

2-Stroke Engine

Bearing Wear Monitoring System

TECHNICAL SPECIFICATIONS



Gap Sensor

Measuring Range	0 ~ 5mm
Measuring Resolution	±0.001mm
Measuring Accuracy	±0.05mm
Power Supply	24V DC (-25 ~ +30%)
Operating Temp.	0 ~ 90 °C
Output Signal	CAN
Protection Grade	IP 68
Vibration	>4G
Mounting	Custom designed bracket for different engine types
Dimensions	M22x1.0mm, L=109mm
Weight	108g
Characteristic	Temp. compensated compact type
No. of sensors per engine	Max. 32 (16 cylinders)



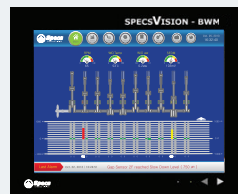
Junction Box

Power Supply	24V DC (-25% ~ +30%)
Interface	CAN
Protection Grade	IP 66
Operation Temp.	-20 ~ 85 °C
Vibration	>4G
Dimensions (R)	W160 x H160 x D90mm
Dimensions (T)	W120 x H122 x D80mm
Weight	1.2kg



Integrated Processing Unit

Power Supply	24VDC (-25% ~ +30%)
Interface	CAN, RS485/232, relay contact
Protection Grade	IP 44
Operation Temp.	0 ~ 60 °C
Vibration	>0.7G
Humidity	20 ~ 95% non-condensing
Dimensions	W320 x H210 x D85 (mm)
Weight	3.5kg



Bearing Condition Monitor

Power Supply	24V DC (-25 ~ +30%)
Interface	6USB, 2RS232, RS485/422, 2Ethernet
Protection Grade	IP 20
Operation Temp.	0 ~ 60 °C
Vibration	>0.7G
Screen	Analog capacitive touch, 15inches, 1024 X 768 X GA
Dimensions	W402 x H330 x D80mm
Weight	8.4kg



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